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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
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09/094,156 06/09/98 SUGIMOTO

T 10517/5

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NEW YORK NY 10004

QM51/0630

EXAMINER
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HWJ, D

ART UNIT	PAPER NUMBER
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3752

DATE MAILED: 06/30/99

66-30-98

**Please find below and/or attached an Office communication concerning this application or proceeding.**

**Commissioner of Patents and Trademarks**

# Office Action Summary

Application No.

09/094,156

Applicant(s)

Sugimoto et al.

Examiner

Hwu

Group Art Unit

3752



☒ Responsive to communication(s) filed on Jun 18, 1999.

☐ This action is **FINAL**.

☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

A shortened statutory period for response to this action is set to expire 3 month(s), or thirty days, whichever is longer, from the mailing date of this communication. Failure to respond within the period for response will cause the application to become abandoned. (35 U.S.C. § 133). Extensions of time may be obtained under the provisions of 37 CFR 1.136(a).

## Disposition of Claims

☒ Claim(s) 1-3 is/are pending in the application.

Of the above, claim(s) \_\_\_\_\_ is/are withdrawn from consideration.

☐ Claim(s) \_\_\_\_\_ is/are allowed.

☒ Claim(s) 1-3 is/are rejected.

☐ Claim(s) \_\_\_\_\_ is/are objected to.

☐ Claims \_\_\_\_\_ are subject to restriction or election requirement.

## Application Papers

☒ See the attached Notice of Draftsperson's Patent Drawing Review, PTO-948.

☐ The drawing(s) filed on \_\_\_\_\_ is/are objected to by the Examiner.

☐ The proposed drawing correction, filed on \_\_\_\_\_ is ☐ approved ☐ disapproved.

☐ The specification is objected to by the Examiner.

☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. § 119

☒ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).

☒ All ☐ Some\* ☐ None of the CERTIFIED copies of the priority documents have been

☒ received.

☐ received in Application No. (Series Code/Serial Number) \_\_\_\_\_.

☐ received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

\*Certified copies not received: \_\_\_\_\_.

☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

## Attachment(s)

☒ Notice of References Cited, PTO-892

☒ Information Disclosure Statement(s), PTO-1449, Paper No(s). 2

☐ Interview Summary, PTO-413

☒ Notice of Draftsperson's Patent Drawing Review, PTO-948

☐ Notice of Informal Patent Application, PTO-152

--- SEE OFFICE ACTION ON THE FOLLOWING PAGES ---

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## DETAILED ACTION

### *Claim Rejections - 35 USC § 103*

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 1 is rejected under 35 U.S.C. 103(a) as being unpatentable over Matsui in view of Marks et al.

The patent to Matsui discloses a fuel injector valve for a diesel engine which opens and closes to provide fluid flow and having a fuel adjusting plate which contains a plurality of first nozzle holes 13 arranged along a first circle on the plate which is coaxial with central axis of the valve body and a plurality of second nozzle holes 12 arranged along a second circle concentric with the first circle and having a diameter larger than that of the first circle. The holes 13 extend through the plate along a respective axis and the holes 12 extend through the plate along their axis.

Matsui does not disclose the acute angles of the hole axes as claimed in the present invention.

The patent to Marks et al. teaches a fuel nozzle for internal combustion engines having a nozzle piece 1 with fuel passages 4 (Column 2, Lines 78-79) whereas the axes of the passages 4 extend at different angles in order to ensure a proper and even distribution of the fuel in the combustion chamber (Column 4, Lines 11-19). Therefore, it would have been obvious to one of ordinary

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skill in the art at the time the invention was made to have modified the device of Matsui by making the nozzle holes of Matsui to be at different angles as taught by Marks et al. in order to prevent fuel sprays from interfering with each other and thus suitably atomizing the injected fuel.

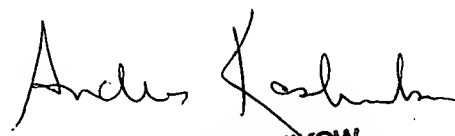
2. Claims 2 and 3 are rejected under 35 U.S.C. 103(a) as being unpatentable over Matsui in view of Marks et al. as applied to claim 1 above, and further in view of Jensen.

The patents to Matsui and Marks et al. disclose the claimed invention except for the recitation of claim 2. The patent to Jensen teaches a fuel injector valve for a diesel engine in which the valve 40 is connected directly into the combustion chamber 12a. Input of the fuel is timed and controlled by a control unit 70. A valve body 41 has a passage 41a which opens into combustion chamber 12a and contains an intake poppet valve 42 having a stem 43 and a face portion 42a at the lower end of the valve stem 43, which gives the appearance of a mushroom shape. At the bottom of the valve housing is a seat 44 for 42a. Spaced axially within the valve housing are valve stem guides 46 and 47 which allow fuel to flow to an outer periphery of face portion 42a instead of the central portion of the mushroom shaped portion of the poppet valve (see Figure 3). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have incorporated into the fuel injector valve of Matsui and Marks et al. a timing device to inject the fuel and a poppet valve whereas the fuel flows to an outer periphery of the mushroom shaped portion of the poppet valve as taught by Jensen in order to make a fuel injector valve which provides uniform and even distribution of fuel to suitably atomize the fuel.

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***Conclusion***

3. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The patents to Kilburn et al., Ishida, Eguchi, and Tarr et al. are pertinent to Applicant's invention in disclosing a fuel injection valve for an internal combustion engine.
4. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Davis Hwu at (703)305-1663.

  
ANDRES KASHNIKOW  
SUPERVISORY PATENT EXAMINER  
TECHNOLOGY CENTER 3700  
6/25/95